

WHAT IS CLAIMED IS:

1. A bus interface unit for transferring data between a plurality of bus devices, said bus interface unit comprising:

1) a first bus device interface comprising: a) a first incoming request bus for receiving request packets from a first one of said plurality of bus devices; b) a first outgoing request bus for transmitting request packets to said first bus device; c) a first incoming data bus for receiving data packets from said first bus device; and d) a first outgoing data bus for transmitting data packets to said first bus device;

2) a second bus device interface comprising: a) a second incoming request bus for receiving request packets from a second one of said plurality of bus devices; b) a second outgoing request bus for transmitting request packets to said second bus device; c) a second incoming data bus for receiving data packets from said second bus device; and d) a second outgoing data bus for transmitting data packets to said second bus device; and

3) an arbitration circuit capable of determining a first priority level associated with a first request packet received from said first bus device and capable of determining a second priority level associated with a second request packet received from said second bus device.

1 2. The bus interface unit as set forth in Claim 1 wherein
2 said arbitration circuit compares said first priority level and
3 said second priority level to determine which of said first and
4 second priority levels is higher.

1 3. The bus interface unit as set forth in Claim 2 wherein
2 said arbitration circuit, in response to a determination that said
3 first priority level is higher than said second priority level,
4 causes said bus interface unit to process said first request packet
5 prior to processing said second request packet.

1 4. The bus interface unit as set forth in Claim 2 wherein
2 said arbitration circuit, in response to a determination that said
3 first priority level is equal to said second priority level, causes
4 said bus interface unit to process said first and second request
5 packets on a rotating turn basis.

1 5. The bus interface unit as set forth in Claim 1 further
2 comprising a time slice timer capable of producing a current time
3 slice value.

1 6. The bus interface unit as set forth in Claim 5 wherein
2 said arbitration circuit is capable of determining a fixed time
3 slice range associated with said first bus device and comparing
4 said fixed time slice range with said current time slice value.

1 7. The bus interface unit as set forth in Claim 6 wherein
2 said arbitration circuit, in response to a determination that said
3 current time slice value is within said fixed time slice range,
4 causes said bus interface unit to process said first request packet
5 prior to processing said second request packet.

1 8. The bus interface unit as set forth in Claim 7 wherein
2 said arbitration circuit, in response to a determination that said
3 current time slice value is within said fixed time slice range,
4 causes said bus interface unit to process said first request packet
5 prior to processing any pending request packet received by said bus
6 interface unit.

1 9. An integrated circuit data comprising:

2 1) N bus devices capable of transferring data with one
3 another; and

4 2) a bus interface unit for transferring data between
5 said N bus devices, said bus interface unit comprising:

6 a) N bus interfaces, each of said N bus interfaces
7 comprising: i) an incoming request bus for receiving request
8 packets from one of said N bus devices; ii) an outgoing
9 request bus for transmitting request packets to said one of
10 said N bus devices; iii) an incoming data bus for receiving
11 data packets from said one of said N bus devices; and iv) an
12 outgoing data bus for transmitting data packets to said one of
13 said N bus devices; and

14 b) an arbitration circuit capable of determining a
15 first priority level associated with a first request packet
16 received from a first bus device and capable of determining a
17 second priority level associated with a second request packet
18 received from a second bus device.

1 10. The integrated circuit as set forth in Claim 9 wherein
2 said arbitration circuit compares said first priority level and
3 said second priority level to determine which of said first and
4 second priority levels is higher.

1 11. The integrated circuit as set forth in Claim 10 wherein
2 said arbitration circuit

3 it, in response to a determination that said first priority
4 level is higher than said second priority level, causes said bus
5 interface unit to process said first request packet prior to
6 processing said second request packet.

1 12. The integrated circuit as set forth in Claim 10 wherein
2 said arbitration circuit, in response to a determination that said
3 first priority level is equal to said second priority level, causes
4 said bus interface unit to process said first and second request
5 packets on a rotating turn basis.

1 13. The integrated circuit as set forth in Claim 9 further
2 comprising a time slice timer capable of producing a current time
3 slice value.

1 14. The integrated circuit as set forth in Claim 13 wherein
2 said arbitration circuit is capable of determining a fixed time
3 slice range associated with said first bus device and comparing
4 said fixed time slice range with said current time slice value.

1 15. The integrated circuit as set forth in Claim 14 wherein
2 said arbitration circuit, in response to a determination that said
3 current time slice value is within said fixed time slice range,
4 causes said bus interface unit to process said first request packet
5 prior to processing said second request packet.

1 16. The integrated circuit as set forth in Claim 15 wherein
2 said arbitration circuit, in response to a determination that said
3 current time slice value is within said fixed time slice range,
4 causes said bus interface unit to process said first request packet
5 prior to processing any pending request packet received by said bus
6 interface unit.

1 17. For use in a bus interface unit comprising N bus
2 interfaces, each of the N bus interfaces comprising: i) an incoming
3 request bus for receiving request packets from a corresponding one
4 of N bus devices; ii) an outgoing request bus for transmitting
5 request packets to the corresponding bus device; iii) an incoming
6 data bus for receiving data packets from the corresponding bus
7 device; and iv) an outgoing data bus for transmitting data packets
8 to the corresponding bus device, a method of arbitrating requests
9 received from the N bus interfaces, the method comprising the steps
10 of:

11 determining a first priority level associated with a
12 first request packet received from a first bus device;

13 determining a second priority level associated with a
14 second request packet received from a second bus device; and

15 comparing the first priority level and the second
16 priority level to determine which of the first and second priority
17 levels is higher.

1 18. The method as set forth in Claim 17 further comprising
2 the step, in response to a determination that the first priority
3 level is higher than the second priority level, of processing the
4 first request packet prior to processing the second request packet.

1 19. The method as set forth in Claim 17 further comprising
2 the step, in response to a determination that the first priority
3 level is equal to the second priority level, of processing the
4 first and second request packets on a rotating turn basis.

1 20. The method as set forth in Claim 17 further comprising
2 the step of generating a current time slice value.

1 21. The method as set forth in Claim 20 further comprising
2 the steps of:
3 determining a fixed time slice range associated with the
4 first bus device; and
5 comparing the fixed time slice range with the current
6 time slice value.

1 22. The method as set forth in Claim 21 further comprising
2 the step, in response to a determination that the current time
3 slice value is within the fixed time slice range, of processing the
4 first request packet prior to processing the second request packet.

1 23. The method as set forth in Claim 22 further comprising
2 the step, in response to a determination that the current time
3 slice value is within the fixed time slice range, of processing the
4 first request packet prior to processing any pending request packet
5 received by the bus interface unit.